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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 689,616	10 13 2000	Tuqiang Ni	2328-049	8431

7590

06 27 2002

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 06 27 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Application No.

Applicant(s)

09/689.616

NI ET AL.

Office Action Summary

Examiner

Art Unit

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 If a reply is filed within the set period of time specified above, less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 If a reply is filed within the set period of time specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
 Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2002.
- 2a) ☐ This action is **FINAL** 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 19-21 and 33-39 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-28 is/are allowed.
- 6) ☒ Claim(s) 1-18, 22-24 and 29-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2
4. ☐ Interview Summary (PTO-413) Paper No(s) _____
5. ☒ Notice of Informal Patent Application (PTO-152)
6. ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election of the specie of Fig. 1B in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 19-21 and 33-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-14 and 29-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7, lines 4-5, the phrase "so peripheral portions of the semiconductor member are outside the coil interior portion" renders the claim indefinite because it appears from Figures 1A and 1B of the application that the semiconductor member is located inside the interior portion of the coil. Clarification is required.

In claim 8-line 4, claim 29-line 3, claim 30-line 2, claim 31-line 4, and claim 3-line 6, the use of the subjective word --slightly-- renders the claim unclear in scope and meaning.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 17-18, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al., WO 99/34399 in view of Collins et al., U.S. Patent 6,077,384.

Baldwin et al. shows the invention substantially as claimed including a vacuum plasma processor 10 for processing workpieces comprising a vacuum chamber 12 having an inlet 32 for supplying gas to the chamber; an electrode arrangement 56 for ionizing gas in the chamber into a plasma, a coil 36 outside the chamber for generating an electromagnetic field for ionizing gas in the chamber to a plasma, a non-magnetic metal arrangement 44 interposed between the coil 36 and the electrode 56; the coil 36, non-magnetic metal arrangement 44 and electrode 56 being positioned and arranged for preventing substantial electric field components of the electromagnetic field from being incident on the electrode while enabling substantial electric and magnetic field components from the coil 36 to be incident on the gas for ionizing the gas (see fig. 1 and page 12-line 25 to page 22-line 14).

Baldwin et al. fails to expressly disclose that the electrode can be a semiconductor material and that the conductivity of the material is greater than 0.1ohm/cm. Collins et al. discloses a similar apparatus in which a ceiling electrode 110 is comprised of silicon, a semiconductor (see fig. 1, and col. 15-line 40 to col. 19-line 15). In view of this disclosure, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to modify the apparatus of Baldwin et al. so as to include the semiconductor electrode of Collins et al. because such material is suitable for constructing the electrode and because it provides low impedance to the RF induction field. Regarding the concentration of dopants in the electrode, it would have been obvious to one of ordinary skill in the art to make the electrode as conductive as possible in order to provide for a more energized plasma.

With respect to claims 2-3, note in Baldwin et al. that the chamber includes a dielectric window 18 which is interposed between the electrode 56 in the chamber and coil 36, and allows for coupling the electromagnetic field into the chamber (see fig. 1).

Concerning claim 5, note in Baldwin et al. that the non-magnetic metal arrangement 44 is spaced from the electrode 56.

With respect to claims 4 and 6, the limitation stating that the non-magnetic metal member abuts the semiconductor member does not render the claim patentable because there are no unexpected results with respect to this configuration or any evidence that such arrangement would significantly affect the overall performance of the plasma processing apparatus. Furthermore, rearrangement of parts has been held to have been obvious, and therefore a prima facie case of obviousness exists.

Regarding claim 7, note that the electrode 56 and coil 36 are spaced approximately the same distance from the chamber center portion.

With respect to claims 8-9, note that the non-magnetic metal element 44 has a periphery outside the periphery of the electrode 56 and less than the diameter of the chamber.

Concerning claim 17, note that Baldwin includes a workpiece holder 20 in the chamber, and a source 22 for applying RF bias to the workpiece 11 via the workpiece holder 20.

With respect to claim 18, a power supply arrangement 40 is included for supplying RF ion energization to the coil and an RF bias source 22 for supplying RF energization to the workpiece and for supplying voltages to the electrode (see RF source 57 in fig. 1) and the non-magnetic metal arrangement (see DC or RF source 48 in fig. 1).

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin et al., WO 99/34399 in view of Collins et al., U.S. Patent 6,077,384 as applied to claims 1-9, 17-18, and 22-24 above, and further in view of Koshimizu, U.S. Patent 6,101,970.

Baldwin et al. and Collins et al. are applied as above but fail to expressly disclose a drive for varying the distance between the workpiece bearing surface and the coil. Koshimizu discloses a drive 122 for varying the distance between the workpiece bearing surface 116 and the coil 110 (see fig. 1 and col. 3-line 51 to col. 4-line 17). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Baldwin et al. modified by Collins et al. to include a drive for varying the distance between the workpiece bearing surface and the coil as disclosed by Koshimizu because this would allow for varying the plasma concentration which the workpiece is subjected to, thus optimizing the apparatus.

Allowable Subject Matter

Claims 10-14 and 29-32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 25-28 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination, fails to anticipate or render obvious, the limitations of: wherein the coil is substantially co-axial with the chamber interior wall and has a substantially circular innermost turn having a diameter approximately equal to the third diameter, as required by dependent claim 10. Additionally, the prior art also fails to teach or render obvious the limitation of: no portion of the semiconductor member is outside an inner turn of the coil, as required by independent claim 25.

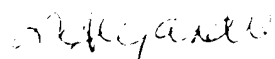
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 305-4545. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills, can be reached on 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 892-7910 for regular communications and 892-7911 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.



Luz L. Alejandro
Patent Examiner
Art Unit 1763

June 25, 2002